2019-nCoV Literature Situation Report (Lit Rep)
March 24, 2020

The scientific literature on COVID-19 is rapidly evolving and these articles were selected for review based on their relevance to Washington State decision making around COVID-19 response efforts. Included in these Lit Reps are some manuscripts that have been made available online as pre-prints but have not yet undergone peer review. Please be aware of this when reviewing articles included in the Lit Reps.

Key Takeaways

- **Several studies provide treatment recommendations for COVID-19 patients with severe acute respiratory distress syndrome.**
- **An alternative method to testing for SARS-CoV-2 infection is proposed using wastewater-based epidemiology, which could provide an early-warning system of imminent transmission.**
- **Lung ultrasound is recommended for evaluating COVID-19 in patients due to its effectiveness and reduced risk of nosocomial spread, rather than chest X-rays and stethoscope.**
- **Results from a cross-sectional survey finds high prevalence of mental health symptoms among HCWs in China, while another article recommends the expansion of tele-mental health services.**
- **Further research supports that SARS-CoV-2 can be transmitted by pre-symptomatic cases and that children may be less susceptible to the virus.**

Transmission

- A cohort study analyzing the viral load and antibody profiles of 23 hospitalized patients with COVID-19 presents important findings: (1) the high viral load during the early phase of illness suggests that patients could be most infectious during this period, (2) the potential for antiviral resistance of SARS-CoV-2, (3) high viral loads in elderly patients could explain the high degree of disease severity.

  Chen and Li (Mar 23, 2020). SARS-CoV-2: virus dynamics and host response. Lancet Infectious Diseases. https://doi.org/10.1016/S1473-3099(20)30235-8

- Le et al report about the first known case of secondary transmission of COVID-19 in an infant in Vietnam.

  Le et al. (Mar 23, 2020). The first infant case of COVID-19 acquired from a secondary transmission in Vietnam. Lancet Child & Adolesc Health. https://doi.org/10.1016/S2352-4642(20)30091-2

- The authors report a COVID-19 family cluster in China caused by a pre-symptomatic case.
- In line with current knowledge, these findings may indicate that COVID-19 is transmittable during the incubation period, and children are less susceptible and fare better when they have contacted the virus.

  Qian et al. (Mar 23, 2020). A Covid-19 Transmission within a family cluster by presymptomatic infections in China. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa316

Testing and Treatment

- The authors propose an alternative method to test for SARS-CoV-2 infection using wastewater-based epidemiology, an approach to predict potential spread by testing for infectious agents in wastewater.
- They developed a paper-based analytic tool to detect SARS-CoV-2 in wastewater on site while providing near real-time and continuous data, and potentially serve as an early warning system to isolate potential carriers.

  Mao et al. (Mar 23, 2020). Can a Paper-Based Device Trace COVID-19 Sources with Wastewater-Based Epidemiology. Environmental Science & Tech. https://doi.org/10.1021/acs.est.0c01174

- This article suggests that lung ultrasound is equally effective as a chest X-ray in detecting lung pathologies, and recommend using it to reduce COVID-19 exposure from patients to HCWs.

  Buonsenso et al. (Mar 20, 2020). COVID-19 outbreak: less stethoscope, more ultrasound. Lancet Respiratory Med. https://doi.org/10.1016/S2213-2600(20)30120-X

- To et al ascertain the serial respiratory viral load of SARS-CoV-2 in posterior oropharyngeal (deep throat) saliva samples from 30 patients with COVID-19 from 2 Hong Kong hospitals, and serum antibody responses in this cohort study.
- Posterior oropharyngeal saliva specimens are non-invasive and acceptable to patients and can be used for initial diagnosis and subsequent viral load monitoring of COVID-19. The study provides information on viral kinetics and antibody response in patients.

  To et al. (Mar 23, 2020). Temporal profiles of viral load in posterior oropharyngeal saliva samples and serum antibody responses during infection by SARS-CoV-2: an observational cohort study. Lancet Infectious Diseases. https://doi.org/10.1016/S1473-3099(20)30196-1

Clinical Characteristics and Health Care Setting

- A systematic review of 45 relevant articles showed that children have accounted for 1-5% of documented COVID-19 cases and have experienced milder disease and better prognosis than adults.
- A case report describes the symptoms, clinical course and treatment of 3 hospitalized children (ages 6 and 8 years and 6 months) who recovered from COVID-19.

  Ludviggson (Mar 23, 2020). Systematic review of COVID-19 in children show milder cases and a better prognosis than adults. Acta Paediatrica. https://doi.org/10.1111/apa.15270

  Lou et al. (Mar 22, 2020). Three children who recovered from novel coronavirus 2019 pneumonia. Jour of Ped & Child Health https://doi.org/10.1111/jpc.14871

- WHO interim guidelines recommend offering extracorporeal membrane oxygenation (ECMO) to eligible patients who develop severe ARDS associated with COVID-19.
- Given the practical restraints of substantially increasing the global availability of ECMO services during the COVID-19 pandemic, it is important to consider other evidence-based treatment options for severe ARDS patients.

  Kollengode et al. (Mar 20, 2020). Planning and provision of ECMO services for severe ARDS during the COVID-19 pandemic and other outbreaks of emerging infectious diseases. Lancet Respiratory Med. https://doi.org/10.1016/S2213-2600(20)30121-1

  Matthay (Mar 20, 2020). Treatment for secure acute respiratory distress syndrome from COVID-19. Lancet Respiratory Med. https://doi.org/10.1016/S2213-2600(20)30127-2

Mental Health and Personal Impact

- This cross-sectional survey collected demographic and mental health data from 1,257 HCWs across several regions in China. Results revealed a high prevalence of mental health symptoms among HCWs treating patients with COVID-19, especially among women and HCWs in Wuhan, with junior titles and on the frontlines. Overall, 50%, 45%, 34% and 72% of all participants reported symptoms of depression, anxiety, insomnia and distress, respectively.
- These findings indicate the need for mental health interventions for HCWs who treat COVID-19 patients.

  Lai et al. (Mar 23, 2020). Factors Associated with Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. JAMA Network. https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2763229

- Zhou et al describe the potential for short and long term mental health problems associated with COVID-19 among the general public and frontline workers, and believe an expansion of tele-mental health services with a focused public education campaign to promote these services would begin to address the widespread need.

  Zhou et al. (Mar 23, 2020). The Role of Telehealth in Reducing the Mental Health Burden from COVID-19. Telemedicine and e-Health. https://doi.org/10.1089/tmj.2020.0068

Public Health Policy and Practice

- Truog et al cite estimates that 2.4 million to 21 million Americans will require hospitalization due to COVID-19 and about 10-25% of the hospitalized patients may need ventilators (based on Italy's experience).
- The article suggests that states should develop strategies for rationing medical supplies, including ventilators, and recommends convening a committee to develop triage criteria.

  Truog et al. (Mar 23, 2020). The Toughest Triage—Allocating Ventilators in a Pandemic. JAMA. https://www.nejm.org/doi/full/10.1056/NEJMp2005689

Other Resources and Commentaries

- Rational use of face masks in the COVID-19 pandemic – Lancet Respiratory Med (Mar 20)
  - Feng outlines recommendations on face masks use by WHO and several countries and calls for governments and public health agencies across the world to make rational recommendations on appropriate face mask use.
- Scientific and ethnical basis for social-distancing interventions against COVID-19—Lancet Infectious Diseases (Mar 23)
  - Lewnard and Lo describe current scientific evidence of social-distancing interventions and argue the need for policy makers to maintain the public's trust through use of evidence-based interventions and transparent, fact-based communication.
- COVID-19: A Global Transplant Perspective on Successfully Navigating a Pandemic – Amer Jour of Transplantation
  - This article describes the impact of COVID-19 on organ transplantation and discusses mitigation strategies such as donor screening, resource planning and a staged approach to handle transplant volume when local resources are limited.